

### **REMARKS**

In view of the foregoing amendments and the following remarks, Applicants respectfully request reexamination of the present application.

Independent Claim 150 has been amended to incorporate the limitation of Claim 166 and Claim 166 has been cancelled. In addition, new Claims 231-233 which depend upon independent Claim 150 have been added. Support for Claims 231-233 can be found, for example, on page 61, lines 7-14 of the present application.

Independent Claim 174 has been amended to recite that the liquid solution comprises multiple precursors and that the metal phase is derived from the nickel metal precursor and the non-metallic phase is derived from the non-metallic phase precursor. Support for this amendment can be found, for example, at page 62, lines 7-13.

Independent Claim 194 has been amended to incorporate the limitation of Claim 197, and Claim 197 has been cancelled. Further, dependent Claim 200 has been amended to correct a lack of antecedent basis for the step recited therein.

Applicants acknowledge with appreciation the Examiner's indication that Claims 166-169, 171, 173, 186, 190, 192, 193, 204, 205 and 210-227 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicants note that Claims 211-227 are in condition for allowance as Claim 211 is already independent and Claims 212-227 dependent therefrom.

### **CLAIM REJECTIONS – 35 U.S.C. § 102**

The Examiner has rejected Claims 150, 154, 163, 164, 174, 177, 184, 185, 187, 189 and 191 under 35 U.S.C. 102(b) as being anticipated by the article by Stopic et al., "Preparation of Nickel Submicron Power By Ultrasonic Spray Pyrolysis", International Journal of Powder Metallurgy", Vol. 32, No. 1, 1996. The Examiner states that the Abstract, the "Experimental Procedure" section, and Table I of Stopic et al. disclose a process substantially identical to that as recited in the instant claims.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Applicants have amended independent Claim 155 to incorporate the limitation of Claim 166, namely that the liquid comprises a reducing agent. The Examiner has indicated that Claim 166 would be allowable if rewritten in independent form. Therefore, Applicants respectfully request removal of this rejection with respect to independent Claim 150 and Claims 151-165, 167-173 and new Claims 231-233, all of which depend upon Claim 150.

Independent Claim 174 has been amended to recite that the liquid solution comprises multiple precursors, including at least a nickel metal precursor and a non-metallic phase precursor. The metal phase of the particles is derived from the nickel metal precursor and the non-metallic phase of the particles is derived from the non-metallic phase precursor. It is respectfully submitted that Stopic et al. does not disclose or suggest the use of multiple precursors in the liquid, where one precursor forms a nickel metal phase and the other precursor forms a non-metallic phase. Therefore, removal of this rejection with respect to independent Claim 174, and Claims 177, 184, 185, 187, 189 and 191 is requested.

#### **CLAIM REJECTIONS – 35 U.S.C. § 103**

The Examiner has rejected Claims 155, 156, 158-162, 165, 172, 178, 180-183 and 188 under 35 U.S.C. 103(a) as being unpatentable over Stopic et al. The Examiner states that the Stopic et al. document referenced does not specify the temperature ranges recited in instant Claims 155, 156 and 178, does not state the particle size and density of instant Claims 158, 159 and 180, does not specify the range of droplet size(s) of instant Claims 161, 162, 182 and 183, does not specify the amount of nickel in the form of nickel nitrate as defined in instant Claims 160 and 181, does not recite the removal of certain size droplets as defined in instant claims 161, 162, 182 and 183,

does not specify the amount of nickel in the form of nickel nitrate as defined in instant Claim 165, does not specify a "non-metallic phase dispersed throughout" nickel particles as required by instant Claim 172, and does not disclose a non-metallic phase precursor comprising particles as defined in instant Claim 188. The Examiner states that these limitations are not seen as defining an invention patentably distinct from the Stopic disclosure, and thus, a prima facie case of obviousness is established between the disclosure of Stopic et al. and the presently claimed invention.

Claims 155, 156, 158-162, 165 and 172 are discussed above with reference to independent Claim 150, from which each of these claims depend. Therefore, removal of the rejection with respect to these claims is respectfully requested.

Claims 178, 180-183 and 188 all depend upon independent Claim 174, which is discussed above. Claim 174 has been amended to recite that the liquid solution comprises multiple precursors including at least a nickel metal precursor and a non-metallic phase precursor. Stopic et al. does not disclose or suggest a liquid solution that includes multiple precursors. With respect to dependent Claim 188, which recites that the non-metallic phase precursor comprises particles suspended in the liquid solution, Applicants respectfully traverse the Examiner's rejection.

In the Office Action, the Examiner states that the non-metallic phase of Stopic appears to result from the incomplete reduction of the precursors used therein. Therefore, the Examiner concludes that one skilled in the art, seeking to be certain to obtain a non-metallic phase in the prior art process, would have included a precursor of this phase in a less active form (e.g., as particles) in the starting material. However, there are a number of flaws in this line of reasoning. First, the non-metallic phase in the prior art process is regarded as undesirable, as is evidenced by the fact that it results from the incomplete reduction of the precursors and Stopic et al.'s desire to eliminate the second phase. Further, even if the second phase was desirable, the teachings of Stopic et al. do not disclose or suggest the use of multiple precursors, let alone multiple precursors where the non-metallic phase precursor comprises particles suspended in a liquid solution. Use of a non-metallic phase precursor enables other reactive phase particles to be within the particles in addition to unreacted metal phase precursor.

Therefore, removal of this rejection is requested.

The Examiner has rejected Claims 151-153, 157, 176 and 179 under 35 U.S.C. 103(a) as being unpatentable over Stopic et al., in view of U.S. Patent No. 4,784,686 by Meek et al. or U.S. Patent No. 5, 064,464 by Sawada et al. The Examiner states that Stopic et al. document discloses the use of nitrogen as a carrier gas, with hydrogen used as a reducing gas, i.e. not as a carrier gas. The Examiner states that the Meek and Sawada patents indicate the art-recognized equivalence of hydrogen to nitrogen as a carrier gas, in processes of reducing metal compounds to fine metal particles. The Examiner also states that based on these disclosures of Meek or Sawada, it would have been considered an obvious expedient by one of ordinary skill in the art to substitute hydrogen for at least a portion of the nitrogen carrier gas used in the Stopic et al. procedure.

Claims 151-153 and 157 depend upon Claim 150, which is discussed above. Therefore, removal of this rejection with respect to these claims is requested.

Claims 176 and 179 are dependent upon independent Claim 174 which is discussed above. Neither Meek et al. nor Sawada et al. disclose or suggest a liquid solution that includes multiple precursors including at least a nickel metal precursor and a non-metallic phase precursor. Therefore, removal of this rejection with respect to these claims is also requested.

The Examiner has rejected Claims 170, 194, 196-203 and 206-209 under 35 U.S.C 103(a) as being unpatentable over Stopic et al. in view of U.S. Patent No. 5,429,657 by Glicksman et al. The Examiner states that Stopic discloses forming nickel particles by reduction of an aerosol of liquid droplets of nickel-containing precursors by heat in a carrier gas, in accord with the instant claims.

The Examiner states that Stopic et al. does not disclose a second metal precursor resulting in a second metal or alloy being present in the final product, as required by the instant claims. The Examiner states that Glicksman indicates that it was known in the art at the time of the invention to use an aerosol reduction process involving two different metal precursors to form alloys, e.g. alloys containing palladium in

an amount as specified in instant Claim 208. The Examiner states that with respect to instant Claim 209, no phase segregation of the two metals is stated or apparent in the Glicksman disclosure. The Examiner concludes that the combined disclosures of Stopic et al. and Glicksman et al. would have taught the presently claimed invention to one of ordinary skill in the art.

Claim 170 depends upon independent Claim 150 which is discussed above. Therefore removal of this rejection with respect to Claim 170 is requested.

Independent Claim 194 has been amended to recite that the aerosol droplets are heated to a temperature of 1200°C to 1400°C. This limitation is an incorporation of the limitation of previous dependent Claim 197. In determining the propriety of the Patent Office case for obviousness in the first instance, it is necessary to ascertain whether or not the reference teachings would appear to be sufficient for one of ordinary skill in the relevant art having the reference before him to make the proposed substitution, combination, or other modification. *In re Linter*, 458 F.2d 1013, 1016, 173 USPQ 560, 562 (CCPA 1972).

With respect to this limitation, Glicksman et al. do not disclose or suggest the fabrication of nickel metal powders and only disclose operating temperatures up to 1000°C. Stopic et al. also only disclose a reaction temperature of up to 1000°C and do not disclose or suggest the fabrication of alloys. It is respectfully submitted that the Examiner has not made the requisite showing under *Linter* and removal of this rejection is requested.


The Examiner states that Claim 195 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stopic et al. in view of Glicksman et al., and further in view of Meek et al. or Sawada et al. The Examiner states that neither Stopic nor Glicksman discloses the use of hydrogen as a carrier gas, as required by the instant claim. The Examiner also states that the Meek and Sawada patents indicate the art-recognized equivalence of hydrogen to nitrogen as a carrier gas, in processes of reducing metal compounds to fine metal particles. The Examiner states that based on these disclosures of Meek or Sawada et al., it would have been an obvious expedient for one of ordinary skill in the art to utilize a carrier gas comprising hydrogen in the process of Stopic et al. (combined

with the second metal of Glicksman et al.). Claim 195 depends upon Claim 194, discussed above, and therefore removal of this rejection is requested.

Applicants believe that all pending claims are in condition for allowance and such disposition is respectfully requested. In the event that a telephone conversation would further prosecute and or expedite allowance, the Examiner is invited to contact the undersigned.

Respectfully submitted,

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